3.2.2.1 Human Health Risk Assessment

27. Some commenters found risk calculations too conservative. [F6-4, N4-3, N4-8, N6-2]

    Response: Uniform CERCLA regulations/process require that the risk assessment estimates used in the comprehensive RI/FS be based on the goal of reducing risk to acceptable levels. The alternatives subsequently considered and the costs estimated for them are likewise required to relate only to actions that reduce the risks to acceptable levels.

3.2.2.2 Ecological Risk Assessment

28. Please explain how ecological risk is being deferred to WAG 10. [N1-8]

    Response: Ecological risks present impacts to entire populations of plants and animals, and thus require evaluation across the entire population of each species present at the INEEL. The assessment of risk to a site-wide species cannot logically be carried out at any single release site within a waste area group. Sites within a waste area group that have only an ecological risk, therefore, may be evaluated under WAG 10, the final INEEL waste area group comprehensive investigation, and will be remediated as appropriate. Those sites will be assumed to have been cleaned up to meet remedial action objectives for human health.

    The ecological risk assessment process for the INEEL has three phases. Two phases are carried out at the level of the individual WAG; the third phase integrates all the WAG information in a site-wide study. The first phase for the WAG 1 comprehensive RI/FS was a screening-level ecological risk assessment (SLERA), which identified data needs for WAG 1 sites and screened out sites at which no contaminants of potential concern are found. The second phase was a site-by-site evaluation of the risks from contaminants to ecological resources (plants and animals) on the WAG-wide level. The second phase uses an approach parallel to the human health risk assessment. The third phase, which will take place under WAG 10, will be the INEEL-wide ecological risk assessment. It will integrate WAG-level results from WAGs 1 through 9 to evaluate risk to INEEL-wide ecological resources. Effects resulting from past contamination and residual impacts from completed interim or remedial actions will be assessed for their potential to adversely affect populations and communities on an ecosystem-wide basis (that is, over the entire INEEL). Remediation will take place as required following completion of that study.

29. Presentation of actual numbers for risks to ecological receptors would be more helpful for public evaluation. [N7-5]

    Response: This is an excellent suggestion and was immediately incorporated into Proposed Plans in preparation. It is a good example of a way to provide much more information to the public without adding appreciably to the plan's length or complexity. Full details of ecological risk assessment results are contained in Section 7 of the comprehensive RI/FS.

3.2.3 Remedial Action Objectives and Compliance with ARARs

30. What cleanup standard for total petroleum hydrocarbons (TPH) will be used at the Fuel Leak site (WRRTF-13) and why? [F6-7, F7-32, N1-11, N1-49]

    Response: The remedial action objective was identified in the revised (November 1998) Proposed Plan for the Fuel Leak site as: "Prevent direct exposure to total petroleum hydrocarbon constituents at concentrations over 1,000 mg/kg, in accordance with the State of Idaho Risk-Based Corrective Action guidance." The RAO was changed in this ROD to: "Prevent exposure to petroleum hydrocarbon constituents in accordance with the State of Idaho Risk-Based Corrective Action guidance." The 1,000 mg/kg reference to total petroleum hydrocarbons was removed to conform to the State of Idaho Risk-Based Corrective Action guidance enacted on January 1, 1997. This change is described in Part II,,Section 11, of this ROD.

31. Why are there no remedial action objectives to protect the Snake River Plain Aquifer from contamination at the Fuel Leak site? [F7-25, N1-10, N1-46]

    Response: The comprehensive RI/FS determined that contamination at the Fuel Leak site does not threaten the aquifer.

32. Why are there no remedial action objectives for the V-Tanks specifying destruction of PCBs or meeting land disposal restrictions (LDRs)? [F7-24, N1-9]

    Response: The remedial action objective (RAO) specified is consistent with the RAO used for tank sites throughout all WAGs at the INEEL. Also, destruction of PCBs will be met through specified ARARs, as listed in Part II of this ROD.

33. Is grouting, as part of a remedy, compliant with relevant laws? [F7-36, F10-7]

    Response: No. It has been determined that grouting, as part of a remedy for the V-Tanks (TSF-09 and TSF-18) or the PM-2A Tanks (TSF-26) will not be compliant with ARARs identified in Part II of this ROD. As a result of this determination, alternatives for these sites that involve grouting to treat or stabilize contaminated media have been eliminated from consideration for selection.

3.2.4 Development of Alternatives

34. It is not clear how the alternatives are developed. [F2-5, F9-6, N5-4]

    Response: The primary objective of the feasibility study is to develop and evaluate remedial alternatives that will protect human health and the environment by removing waste; by eliminating it through treatment; or by controlling, reducing, or eliminating risks posed by each pathway at a site. CERCLA guidance (40 CFR 300.430) directs that the alternatives that are developed include:

    (1) The No Action alternative (which may be no further action if some removal or remediation has already taken place)

(2) One or more alternatives that provide little or no treatment, but protect through engineering and, as necessary, institutional controls

(3) A range of alternatives involving treatment to reduce toxicity, mobility, or volume of contaminants and, as appropriate, an alternative that removes or destroys the contamination

(4) One or more innovative treatment technologies if they offer the potential for equal or better performance or implementability, fewer or less adverse impacts, or lower costs in comparison to demonstrated treatment technologies.

Three criteria are used to develop and screen alternatives: effectiveness (short-term and long-term), implementability, and cost. Alternatives that do not provide adequate protection of human health and the environment or comply with ARARs are to be eliminated from further consideration. This is done first, prior to any other evaluation. Alternatives that are technically or administratively unfeasible or that would require equipment, specialists, or facilities that are not quickly available may be eliminated. If costs of construction or operations and maintenance are grossly excessive compared to overall effectiveness, an alternative may be considered for elimination.

35. What does Limited Action involve that makes it so costly? [F6-10]

    Response: Limited Action involves long-term use of institutional controls and environmental monitoring, including 5-year reviews, at any site where contamination remains in place, or where residual contamination remains following treatment or removal. The long-term institutional controls and environmental monitoring may need to be continued through the entire 100-year control period. The cost of these activities may increase the total cost of the Limited Action alternative above that of an immediate solution.

36. In a presentation to the Citizens Advisory Board, the use of concrete as a grouting material was mentioned. Given its lack of stability, why would concrete be preferred to other types of grouting material? [F12-4]

    Response: The actual grouting material to be used would be specified in the remedial design. Factors considered in selection would include leachability, durability, the dry mix–to–liquid ratio, and compressive strength, as well as stability. A treatability study for in situ stabilization (grouting) was conducted in 1998 and is documented in the *Final Report, Treatability Study for LMITCO TSF-09 V-1, V-2, and V-3 Tank Waste,* September 1998 (INEEL/EXT-98-00739). Analytical results for waste drawn from the V-Tanks showed that three grouting mixes, all containing some proportion of Portland cement, met the criteria for a suitable stabilization/solidification option. However, grouting to treat or stabilize waste is not part of any remedy selected in this ROD, as detailed in Part II. Alternatives involving grouting for treatment or stabilization of contaminated media were determined not to meet ARARs for the V-Tanks (TSF-09 and TSF-18) or the PM-2A Tanks (TSF-26).

37. The use of the proposed INEEL CERCLA Disposal Facility (ICDF) as an on-Site repository is rejected on several grounds: safety and legality of a location over the Snake River Plain Aquifer; availability; waste acceptance criteria; and design life. [F7-37, F7-40, F7-42, F7-43, F10-4, F10-6, N1-26, N1-30, N3-6, N5-5]

Response: The actual on-Site disposal location for TAN materials, which could be the Radioactive Waste Management Complex (RWMC), the proposed ICDF, or another facility, will be determined during remedial design following implementation of this ROD. The proposed ICDF would be a landfill for low level radionuclide-contaminated soil and debris. Selection of the ICDF for disposal of TAN materials depends at least in part on the timeframe associated with construction of the facility and its waste acceptance criteria. Costs for this facility, however, would likely be much lower than current RWMC disposal fees.

The development of the ICDF itself is being planned under Waste Area Group 3 at the Idaho Nuclear Technology and Engineering Center (INTEC; formerly the Idaho Chemical Processing Plant). A description of the proposed ICDF, including its siting, design, capacity, lifespan, and waste acceptance criteria, was presented in October 1998, in the Proposed Plan *for Waste Area Group 3 at the Idaho Chemical Processing Plant.* The Record of Decision for Waste Area Group 3 is expected to be finalized in September 1999.

3.2.5 Implementation of Alternatives

38. It is hoped that TAN actions will use resident site personnel as the primary labor. [F3-1]

    Response: Most of the activities to remediate TAN sites under this ROD will be carried out by contractors, who may use qualified local labor as appropriate. The cost estimates for remedial actions considered under this ROD assume that the job will be competitively bid within the local subcontracting community, and INEEL Site Stabilization wages will apply. It is the contractor's business prerogative to decide whether workers employed by their company will be acquired locally or from out of state sources. The contractor or contractors who carry out remediation activities under this ROD will be required to provide employees who are qualified to do the necessary work.

39. Will revegetation use native plant species? [N6-12]

    Response: DOE guidance on revegetation is used to determine what is used. Crested wheatgrass, not a native species, is currently a typical choice for planting on CERCLA remediated sites. Factors in the choice of revegetation species include the availability of seed and the need for post-planting care.

3.2.5.1 Environmental Monitoring

40. Describe environmental monitoring more fully. [F10-10, N3-10]

    Response: Environmental monitoring is the sampling of soil, air, water, plants, or animals to detect changing conditions at a site that may require further evaluation. Environmental monitoring would continue for a least 100 years after the site is remediated if contamination remains at the site. For the seven sites to be remediated under this ROD, environmental monitoring would only be required at the Disposal Pond (TSF-07), and the Burn Pits (TSF-03 and WRRTF-01).

    Environmental monitoring under the CERCLA process may consist of the collection and analysis of air, soil, plants, and other media from a site. Air monitoring may include the use of high- and low-volume air samplers to determine whether fugitive radionuclides escape sites where contaminated surface soils exist. Soil monitoring may include radiation surveys over and around sites where contaminated soil and debris are left in place to evaluate whether radionuclides are mobilized to the surface.

The specific types of environmental monitoring conducted at TAN sites where contamination remains in place or residual contamination may remain after treatment or removal actions will be determined during the remedial design phase.

3.2.5.2 *Institutional Controls*

41. Please describe in more detail the nature of institutional controls. How they are integrated with other elements of a remedial action? If they will be the only measure in 100 years, why can't they be considered as the only remedy now? [F5-4, F10-9, N3-10]

    Response: Institutional controls are ongoing actions to minimize potential threats to human health and the environment. Institutional controls include legal access restrictions, such as deed restrictions, and physical access restrictions, such as fencing, signs, physical structures such as embankments, and security measures. Deed restrictions, which limit the available use of and activities that can be performed at a given site, prevent the completion of exposure pathways that would result in an unacceptable risk to human health. Physical access restrictions limit exposure to contaminants in soil and are effective for contamination that is not likely to become airborne.

    Institutional controls have relatively low annual costs and can be an effective component of a CERCLA response, especially as a supplement to engineering controls. Institutional controls are not substituted for active response measures (i.e., treatment or removal) as the sole remedy unless such active measures are determined not to be practicable during the evaluation of alternatives. At any site where the remedial measure leaves contamination in place at levels that could potentially pose a risk to human health, institutional controls would be implemented to maintain protectiveness. Site reviews every 5 years would evaluate the effectiveness of the institutional controls. Permanent markers will be installed at any site at which radioactive contamination is left in place.

    Institutional controls would be maintained while the responsible authority is in control of the site, which at INEEL will be a minimum of 100 years following site closure. The institutional control period is the term referring to this duration of site responsibility. At TAN, the 100-year institutional control period is assumed to begin in 1999 and end in 2099. Part II, Section 12, of this ROD provides more details on institutional controls for WAG 1 sites.

3.2.6 Evaluation of Alternatives

42. The role of the CERCLA criteria in selecting the preferred alternative is not clearly stated in general, or for specific sites. [F5-3, N5-3]

    Response: CERCLA guidance requires that remedial alternatives be compared according to nine evaluation criteria. The criteria are grouped in three categories: (1) threshold criteria that relate directly to statutory findings and must be satisfied by each chosen alternative, (2) balancing criteria used to refine the selection of candidate alternatives for the site by evaluating their effectiveness, implementability, and cost, and (3) modifying criteria that measure the acceptability of the alternatives to state agencies and the community.

The two threshold criteria, which must be satisfied by the selected remedy, are overall protection of human health and the environment, and compliance with ARARs. The five balancing criteria, which are used to refine the selection of the candidate alternatives, are (1) long-term effectiveness and permanence, (2) reduction of toxicity, mobility, or volume through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. The comparison of alternatives on the cost criterion is specifically made in terms of cost-effectiveness, that is, the cost of the remedy relative to its overall effectiveness as measured by the first three balancing criteria. An alternative satisfies this criterion best if its costs are proportional to its overall effectiveness. The modifying criteria, state and community acceptance, are used in the final evaluation of remedial alternatives.

43. The No Action alternative must be presented and evaluated for each site, and isn't. [F6-1]

    Response: The No Action alternative must be developed for each site during the feasibility study to comply with requirements of the NCP, as described in CERCLA regulations section 40 CFR 300.430(e)(6) and EPA's guidance for conducting remedial investigations and feasibility studies under CERCLA (EPA/540/G-89/004). (If some removal or remedial action has already occurred at the site, the No Action alternative is actually a No Further Action alternative.) Under the No Action alternative, existing management practices at a release site would be continued. The No Action alternative provides a baseline against which other alternatives can be compared during the evaluation of all alternatives against the CERCLA criteria. CERCLA evaluation threshold criteria for overall protectiveness and compliance with ARARs may or may not be met by the No Action alternative, depending on the particular characteristics of the release site. If the No Action alternative does not meet the threshold criteria, it is not evaluated further. Only those alternatives that do meet the threshold criteria are considered for selection, and only the alternatives under consideration are required to be presented in the Proposed Plan.

    Section 12 of the WAG 1 comprehensive RI/FS provided a detailed analysis of all alternatives for each site requiring remedial action, including the No Action alternative. In the revised Proposed Plan, the No Action alternative was not presented for the V-Tanks (TSF-09 and TSF-18), the PM-2A Tanks (TSF-26), or the Soil Contamination Area South of the Turntable (TSF-06, Area B) sites, because evaluation demonstrated that the No Action alternative failed to meet threshold criteria.

44. One commenter feels that off-site disposal costs have been exaggerated, and consequently, this option may not be correctly ranked. [F8-2, F8-4, F8-6]

    Response: Off-site disposal cost estimates take into account the actual cost of previous disposal activities, such as the disposal fee and transportation costs. On-Site estimates consider the cost of design, construction, operation, closure, and monitoring (i.e., fully loaded cost estimate) of the repository.

    Off-site disposal cost estimates for the V-Tanks (TSF-09 and TSF-18) and the PM-2A Tanks (TSF-26) are for disposal of contaminated soils only. Costs for disposal of the type of contamination represented by the tank contents at the assumed off-site facility, Envirocare of Utah, were not available at the time the estimate was generated. The cost estimates, along with assumptions, are contained in Appendix J of the comprehensive RI/FS.

45. One commenter feels that off-site disposal implementability may be incorrectly ranked. It seems to be as easy to implement as other alternatives. [F8-3]

Response: The comparative evaluation of alternatives may show that off-site disposal alternatives are less implementable than on-Site disposal alternatives as a result of several factors, including the need for compliance with interstate transportation regulations, the need for compliance with multiple state criteria, and the activities involved in transport procurement.

46. The ranking of in situ vitrification, which is an alternative developed for the V-Tanks (TSF-09 and TSF-18) and the PM-2A Tanks (TSF-26), is questioned on several grounds: cost, uncertain effectiveness, and unproven implementability. [F8-5]

    Response: The effectiveness and implementability of the planar type of in situ vitrification (planar ISV) was evaluated in a 1998 treatability study. The results of that study support the ranking of planar ISV as shown in the November 1998 Proposed Plan. The ISV technology typically is less costly than multiple technologies required for in situ treatment of mixtures of organic and heavy metal contaminants such as exist in these tank sites. However, the treatability study also identified additional costs that were not included in the cost estimate prepared for the comprehensive RI/FS or presented in the Proposed Plan. As a result, the cost for Alternative 4 – In Situ Vitrification for the V-Tanks sites increased by 50%, lowering its relative ranking due to this decrease in cost-effectiveness.

    At the same time, several new options became available for Alternative 2 -- Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. When the V-Tanks alternatives were originally developed, reasonable options entailing removal and off-site treatment and disposal were not available for the tank wastes. Facilities either did not exist or did not have permits to dispose of mixed wastes similar to those in the V-Tanks. Two commercial facilities are now available, making this an implementable alternative that will comply with ARARs.

    The V-Tanks alternatives were reevaluated to factor in the new information on the ISV cost and the off-site treatment options. The new variation of Alternative 2 would have high implementability and greater cost-effectiveness than Alternative 4. Based on the reevaluation, Alternative 2 was selected as the remedy for the V-Tanks. Additional details on the reevaluation of alternatives for the V-Tanks are in Part II, Section 7.1, of this ROD.

3.3 Release Sites/Groups at WAG 1

3.3.1 V-Tanks (TSF-09 and TSF-18)

3.3.1.1 V-Tanks Description

47. Several comments contended that complete characterization of the V-Tanks contents must be carried out before specific risks can be defined, remedies can be evaluated, and a selection made. What are the actual contaminant contents of the tanks, in terms of listed waste, high mercury content, PCBs, and alpha contamination? Is remediation related to the presence of PCBs and hazardous components in the tanks? Do the tank contents include U-235? Why was U-235 mentioned in the February Proposed Plan, but not in the November revision? Did the concern go away? How can the Agencies carry out a CERCLA action at a site where the risk has not been defined? Why are the tanks being remediated? Even if they leaked, the material would be more than 10 feet below the ground surface and would not threaten the groundwater. [F6-11, F6-13, F6-15, F6-16, F7-17/N1-17, F7-18/N1-18]

Response: The V-Tank sites require remedial action to address contaminated soils surrounding the tanks. The tanks themselves are partially filled with liquids and sludges contaminated with metals, radionuclides, and organic materials. The contamination in the surrounding soils originated during transfer of wastes to and from the tanks. The contamination in the tanks is known from process knowledge and sampling to include metals (barium, cadmium, chromium, lead, mercury, and silver), volatile organic compounds (trichloroethene, 1,1,1-trichloroethane, carbon tetrachloride, and acetone), semi-volatile organic compounds (PCBs and Stoddard solvent), and radionuclides (cesium-137, cobalt-60, strontium-90, and various isotopes of plutonium and uranium).

The uranium-235 in the tank contents was further evaluated after the publication of the February 1998 Proposed Plan. It was determined that the quantities of uranium-235 that are present are not sufficient to pose a risk of criticality and do not require specific remediation. Results of this evaluation could have been described in the revised Proposed Plan. The study is available in the Administrative Record in *OPE-ER-98, Katie Hain to Wayne Pierre, EPA, and Dean Nygard, IDHW.* Further evaluations will be performed during the remedial design phase to verify that the selected remedy will not result in a criticality concern.

Since the tanks have not leaked, they are not a past release and, therefore, were not eligible for calculation of risk in the OU 1-10 baseline risk assessment. The tank contents were included in the feasibility study by agreement among the Agencies. Sufficient information on the tank contents was available to establish the potential risk and to evaluate remedial action alternatives for the contents. Remediation of the site would be much more difficult if it is deferred until after a release has occurred. It is more cost-effective to treat the tank contents before they have leaked and at the same time as the surrounding soils, which must be remediated at this time. Timeliness and greater efficiency will be achieved by treating the tank contents now, in situ, rather than deferring action until after a release has occurred. It is true that the depth of the V-Tanks might preclude there being any exposure pathway. Good management practice, however, would not leave these constituents in place.

3.3.1.2 *V-Tanks Alternatives*

48. Would an ARAR waiver for the V-Tank contents be more cost-effective than treatment? Are the Agencies against obtaining an ARAR waiver? If so, they must define more clearly what the remediation requirements are for the radionuclide-contaminated soils at this site, as well as for the tank contents. [F6-16]

Response: The Agencies are not in favor of requesting an ARAR waiver for this site. ARAR waivers must meet certain specific requirements, and concurrence for ARAR waivers must be obtained from the State. State concurrence is not anticipated for this site. It is anticipated that the selected remedy for the V-Tanks sites – Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal – will address the principal risks posed by the V-Tanks by removing the source of contamination and thus breaking the pathway by which a future receptor may be exposed. Specific remediation goals for contaminated media at this site will be specified in the remedial design.

49. Why weren't alternatives considered that treat or destroy organics (such as biodegradation or dechlorination alternatives)? The comment notes that General Electric has carried out work on biodegradation of PCBs. [F6-17, F9-5]

Response: Individual treatment of PCBs would have very low feasibility and cost-effectiveness at this site. Biodegradation or dechlorination would treat the volatile organic compounds ("organics"), including PCBs. However, additional treatment for the metals and radionuclides would be required. Considerations of treatment effectiveness and cost-effectiveness required development of remedial alternatives for this site that would treat all contaminants simultaneously during one action. Pretreatment of some contaminants (such as PCBs) can reduce the effectiveness of subsequent treatments for other contaminants.

50. The contaminants of concern (COCs) and risks at the PM-2A tanks are described as being very similar to those at the V-Tanks. Why are the preferred alternatives different? Would it be possible to absorb the liquid in the PM-2A tanks (as was done with the V-Tanks) and then use the industrial vacuum (This question may have unintentionally switched the names of the tank sites)? [F6-14, N5-8, N5-10]

    Response: The COCs at these two sites are similar. The PM-2A Tanks are 5 times larger than the V-Tanks. The PM-2A Tanks contain a few inches of sludge and essentially no liquid, while the V-Tanks contain mostly liquid with very little sludge. Because of these differences, similar alternatives could be developed but evaluation resulted in strong differences in their overall implementability.

    In situ vitrification (ISV) has now been demonstrated in a 1998 treatability study to be feasible for tanks up to the size of the V-Tanks (10,000 gal). However, the PM-2A Tanks are 50,000 gal and the implementability is uncertain.

    The PM-2A Tanks selected remedy does, in fact, use an industrial vacuum on liquid absorbed into diatomaceous earth. It seems likely that the original comment (N5-10) was intended to question whether the vacuum technology developed for the PM-2A Tanks could also be used on the V-Tanks. The vacuum removal alternative was developed for the PM-2A Tanks specifically to deal with the removal problems caused by the absence of liquid in the tank contents. It is a vacuum excavation technology in which a high-velocity air stream penetrates, expands, and breaks up the solids and sludges, which are then captured by a high-powered vacuum air stream. The revised Proposed Plan did not clarify that the alternative involves air-jet excavation before vacuum removal of the sludge.

    Alternatives involving vacuum extraction or stabilization were developed for the V-Tanks, but were ranked lower than the selected remedy because of problems with implementability or effectiveness. Detailed descriptions of the alternatives developed for these two sites and their evaluations are in the comprehensive RI/FS and the Feasibility Study Supplement.

51. Several comments object to selection of a remedy before the required treatability studies are performed. One comment notes specifically that the February Proposed Plan stated that further evaluation of the U-235 contamination was required, and asks what kind of evaluation this will be, why it has not taken place, and how it could affect the preferred alternative. Another comment asks why the November Proposed Plan no longer discusses this contaminant and its planned evaluation. A commenting group notes that the February Proposed Plan's admission that the treatability study had not been completed implied little assurance that ISV can work. [F7-34, F7-38, F9-2, N1-22]

    Response: Two treatability studies were performed to evaluate the feasibility and effectiveness of alternatives for the V-Tanks that involved in situ vitrification or in situ stabilization (grouting) and treatment of tank contents. The treatability study for in situ stabilization (grouting) is described in *Final Report, Treatability Study for LMITCO TSF-09 V-1, V-2, and V-3 Tank Waste*, September 1998 (INEEL/EXT-98-00739). Analytical results on waste drawn from the V-Tanks showed that three grouting mixes met the criteria for a suitable stabilization/solidification option. Pretreatment of trichloroethene, tetrachloroethene, and PCBs was also tested. The study demonstrated that two of the grouting mixes could successfully be used following pretreatment to destroy the organic contaminants.

The treatability study for in situ vitrification (ISV) is described in *Treatability Study for Planar In Situ Vitrification of INEEL Test Area North V-Tanks*, October 1998 (INEEL/EXT-98-00854). The technology that was tested is a modification called planar ISV, which melts from the sides of the tank inward toward the center (instead of top downward as in the original ISV technology). The treatability study showed that planar ISV could safely and effectively remediate the V-Tanks sites.

The CERCLA process provides for general analysis of alternatives as part of the RI/FS process. Data collection efforts and treatability studies are required to the extent necessary to select a remedy. Studies to develop specific details of design are not intended to be carried out until the remedy is actually selected in the ROD, to avoid delays in the RI/FS process, and for best allocation of resources.

The uranium-235 in the tank contents was further evaluated after the publication of the February 1998 Proposed Plan. It was determined that the quantities of uranium-235 that are present are not sufficient to pose a risk of criticality and do not require specific remediation. Results of this evaluation could have been described in the revised Proposed Plan. The study is available in the Administrative Record in *OPE-ER-98, Katie Hain to Wayne Pierre, EPA, and Dean Nygard, IDHW*. Further evaluations will be performed during the remedial design phase to verify that the selected remedy will not result in a criticality concern.

52. Several commenters expressed a preference for alternatives other than ISV, citing effectiveness, feasibility, and cost as reasons. Several stated that selection of Alternative 4 – In Situ Vitrification in the February Proposed Plan was not supported by the comparative rankings of alternatives presented, nor by the information given on the evaluation and selection process. One commenter found Alternative 3 – Soil Excavation, In Situ Treatment of Tank Contents, and Soil Disposal unacceptable as well as Alternative 4. [F6-12, F9-1, F9-2, F12-9, N1-14, N2-1]

Response: A treatability study of planar ISV, a technological improvement over conventional ISV, was carried out in 1998 for the V-Tanks. The report on this study, *Treatability Study for Planar In Situ Vitrification of INEEL Test Area North V-Tanks*, October 1998 (INEEL/EXT-98-00854), is available in the Administrative Record. The results of the study demonstrated that planar ISV could be readily implemented and would have high effectiveness on the contamination present in and surrounding the V-Tanks. The study's results fully support the ranking of ISV as shown in the November 1998 revised Proposed Plan. A discussion of the study and its results could have been included in the plan. The ISV technology typically is less costly than the multiple technologies required for in situ treatment of mixtures of organic and heavy metal contaminants such as exist in these tank sites.

However, the treatability study also identified additional costs that were not included in the cost estimate prepared for the comprehensive RI/FS or presented in the Proposed Plan. As a result, the Alternative 4 – In Situ Vitrification cost for the V-Tanks sites increased by 50%, lowering its relative ranking due to this decrease in cost-effectiveness.

At the same time, several new options became available for Alternative 2 – Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. When the V-Tanks alternatives were originally developed, reasonable options entailing removal and off-site treatment and disposal were not available for the tank wastes. Facilities either did not exist or did not have permits to dispose of mixed wastes similar to those in the V-Tanks. Two commercial facilities are now available, making this an implementable alternative that will comply with ARARs.

53. The V-Tanks alternatives were reevaluated to factor in the new information on the ISV cost and the off-site treatment options. The new variation of Alternative 2 would have high implementability and greater cost-effectiveness than Alternative 4. Based on the re-evaluation, Alternative 2 was selected as the remedy for the V-Tanks. Additional details on the reevaluation of alternatives for the V-Tanks are in Part II, Section 7.1, of this ROD. Two comments supported Alternative 4 – In Situ Vitrification. Many comments asked questions about how ISV could be successfully implemented. Are the Agencies aware of ISV's reliability problems and accident potential? What is the plan to prevent these? What are the plans for double containment and other protection of workers? Should the selection of ISV be termed a technology demonstration? How does ISV reduce risk from the soil pathway, when it does not remove the soil? [F6-13, F6-18, F9-4, N1-13, N1-15, N1-16, N3-12, N5-9, N6-5, T1-2]

    Response: The ISV technology that was tested is a modification called planar ISV. It is described in the *Treatability Study for Planar In Situ Vitrification of INEEL Test Area North V-Tanks*, October 1998 (INEEL/EXT-98-00854). Planar ISV is an enhancement of conventional ISV technology that resolves problems that have occurred using conventional ISV. By treating the contamination matrix from the ground surface down, conventional ISV can trap volatile materials below the melt resulting in pressure buildup that can cause displacement of material from the melt pool, overheating of the off-gas treatment system, and process upsets. Planar ISV resolves these issues by positioning the melt planes to the sides of the contamination area, allowing the melt to proceed from the sides inward toward the center so the vapors can vent upward and be effectively and safely removed. Reliability problems and process upsets are not anticipated for planar ISV.

    Planar ISV could simultaneously treat, in situ, the radioactive and chemically hazardous materials in the V-Tanks (including the PCBs) and the contaminated soil surrounding the tanks. A full-scale demonstration to meet Toxic Substances Control Act (TSCA) requirements was performed at the Apparatus Service Center Superfund Site in Spokane, Washington, to treat PCBs. All objectives were met and an EPA TSCA permit was issued in October 1995. A large-scale remediation was successfully performed on dioxin and other organic wastes from the Wasatch Chemical Superfund Site in Salt Lake City, Utah. At both sites, treatment efficiency of over 99.99% was demonstrated. The planar ISV system has been accepted for use on four Superfund projects to date. These previous demonstrations and the treatability study show that planar ISV could be expected to successfully treat the V-Tank contents and surrounding contaminated soil to achieve final remediation goals.

    For the V-Tanks treatability study, two tests were performed. The first test, using soil from the TAN site, demonstrated that planar ISV can develop a melt of sufficient scale and configuration to process the 10,000-gal V-Tanks. The second test was performed on a 4,500-gal scaled-down version of a V-Tank containing simulated sludge and liquids, including a non-radioactive cesium compound. The volatile materials present in the actual V-Tanks were also simulated. The remaining void space in the tank was filled with soil. A post-test evaluation showed that the melts developed symmetrically with no pressure build-up generated within the tank. The tank was successfully treated with no process upsets. Evaluation of the pre- and post-test chemical sampling data indicated that, despite its relatively remote placement in the bottom of the tank, the cesium was essentially uniformly dispersed and 99.97% of the cesium was retained in the vitrified block. Volatile compounds in the soil were also remediated. The minor quantities of debris (rocks, wire, plastic, and wood) that were processed during the test had no observable effect on the ISV process. Although organics were not present in the treatability test, it has been successfully demonstrated previously that ISV results in the effective destruction of organic contaminants while ensuring full compliance with air emission requirements. The vitrified block was excavated, fractured, and sampled to verify effectiveness. The concentration of cesium, lithium, and molybdenum tracer materials were shown to be essentially uniform throughout the monolith.

However, the treatability study also identified additional costs that were not included in the cost estimate prepared for the comprehensive RI/FS or presented in the Proposed Plan. As a result, the Alternative 4 – In Situ Vitrification cost for the V-Tanks sites increased by 50%, lowering its relative ranking due to this decrease in cost-effectiveness.

At the same time, two commercial facilities became available for ex situ treatment of the tank contents, increasing the implementability of Alternative 2 – Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. The facilities are permitted to dispose of mixed wastes similar to those in the V-Tanks. The V-Tanks alternatives were reevaluated to factor in this new information on the ISV cost and the off-site treatment availability. Because the new variation of Alternative 2 would have equally high long-term effectiveness and implementability and greater cost-effectiveness compared to Alternative 4, Alternative 2 was selected as the remedy for the V-Tanks. Additional details on the reevaluation of alternatives for the V-Tanks are in Part II, Section 7.1, of this ROD.

54. Many questions were asked about how the ISV results would be compliant with ARARs. How will ARARs requiring destruction of PCBs, treatment of mercury, and treatment for other constituent wastes be met? How will the melt be characterized to verify uniformity and treatment effectiveness? Will the melt satisfy land disposal restrictions (LDRs)? [F7-26/N1-20, F7-33, F7-35/N1-23, F7-36, N1-19, N1-21, N1-24, N3-11, N3-13, N3-14, N3-15]

    Response: The Agencies would enforce all applicable ARARs, including LDRs, as identified in Part II of this ROD. Verification techniques would be described in the remedial design. The selected remedy for the V-Tanks was changed to Alternative 2 – Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal during a reevaluation of alternatives for this site, triggered by an increase in the estimated cost for the ISV alternative, and the new availability of off-site commercial treatment facilities permitted to handle mixed wastes similar to those in the V-Tanks.

3.3.2 PM-2A Tanks (TSF-26)

3.3.2.1 PM-2A Tanks Description

55. The PM-2A Tanks site characterization is incomplete. Please describe (1) the extensive soil removal from the tank area in the mid-1980s, and (2) the extent of analytical data on tank contents. How can risk be assessed and remediation decisions made, given the lack of data on contents of both tanks? [F7-19/N1-25]

Response: The PM-2A Tank system was shut down in 1975 after 20 years of use because of operational difficulties and spillage. Subsequent removal actions have been summarized in the 1995 OU 10-06 Removal Action documentation. It is unclear which removal action the comment refers to. Removals actions include (1) removal of most of the liquids in the late 1970s; (2) dismantlement and deactivation of the aboveground and underground hardware and piping in 1981 and 1982; (3) removal of remaining liquids from the tanks and partial filling with diatomaceous earth to dry the sludges in 1981; (4) removal of 6 in. of top soil from a 75- by 150-foot area northeast of the tanks in the mid- to late-1980s; and (5) a non–time critical removal action in 1995.

The PM-2A Tanks sites require remedial action to address contaminated soils surrounding the tanks. The contamination in the surrounding soils originated during transfer of wastes to and from the tanks and during removal of liquids after operations ended. The tanks themselves contain only a few inches of contaminated sludge. When the tanks were emptied, only an inch of liquid remained in the bottom of each, to which diatomaceous earth was added as an absorbent. The contamination in the sludge is known from process knowledge and sampling to include metals (barium, cadmium, chromium, lead, mercury, and silver), organic materials (including PCBs), and radionuclides (cesium-137, cobalt-60, strontium-90, and various isotopes of plutonium and uranium).

Since the tanks have not leaked, they are not a past release and, therefore, were not eligible for calculation of risk in the OU 1-10 baseline risk assessment. The tank contents were included in the feasibility study by agreement among the Agencies. Sufficient information on the tank contents was available to establish the potential risk and to evaluate remedial action alternatives for the contents. Remediation of the site would be much more difficult if it is deferred until after a release has occurred. It is more cost-effective to treat the tank contents before they have leaked and at the same time as the surrounding soils, which must be remediated at this time. Timeliness and greater efficiency will be achieved by treating the tank contents now, rather than deferring action until after a release has occurred.

3.3.2.2 PM-2A Tanks Alternatives

56. The PM-2A Tanks preferred alternative (Alternative 3d – Soil Excavation, Tank Content Vacuum Removal, Treatment, and Disposal) received some support. Another commenter supported Alternative 3 in general, for reasons of feasibility. [N2-2, N6-6, T1-2]

    Response: Alternative 3d is preferred because it would use a proven technology to achieve long-term effectiveness through removal of contaminants. The decontaminated tanks would not need to be removed. The cost-effectiveness is very high relative to other alternatives.

57. The contaminants of concern (COCs) and risks at the PM-2A tanks are described as being very similar to those at the V-Tanks. Why are the preferred alternatives different? Would it be possible to absorb the liquid in the PM-2A tanks (as was done with the V-Tanks) and then use the industrial vacuum? [F6-14, N5-8, N5-10]

    Response: The COCs at these two sites are similar. The PM-2A Tanks are 5 times larger than the V-Tanks. The PM-2A Tanks contain a few inches of sludge and essentially no liquid, while the V-Tanks contain mostly liquid with very little sludge. Because of these differences, similar alternatives could be developed, but evaluation resulted in strong differences in their overall implementability.

In situ vitrification (ISV) has now been demonstrated in a 1998 treatability study to be feasible for tanks up to the size of the V-Tanks (10,000 gal). However, the PM-2A Tanks are 50,000 gal and the implementability is uncertain.

The PM-2A Tanks selected remedy does, in fact, use an industrial vacuum to remove the waste. It seems likely that the original comment (N5-10) was intended to question whether the vacuum technology developed for the PM-2A Tanks could also be used on the V-Tanks. The vacuum removal alternative was developed for the PM-2A Tanks specifically to deal with the removal problems caused by the absence of liquid in the tank contents. It is a vacuum excavation technology in which a high-velocity air stream penetrates, expands, and breaks up the solids and sludges, which are then captured by a high-powered vacuum air stream. The revised Proposed Plan did not clarify that the alternative involves air-jet excavation before vacuum removal of the sludge.

Alternatives involving vacuum extraction or stabilization were developed for the V-Tanks, but were ranked lower than the selected remedy because of problems with implementability or effectiveness. Detailed descriptions of the alternatives developed for these two sites and their evaluations are in the comprehensive RI/FS and the Feasibility Study Supplement.

58. Many questions about the PM-2A Tanks preferred alternative's implementation and compliance with ARARs were received. What is the difference between stabilization and treatment? Is this a new distinction for INEEL? How does it apply to past INEEL stabilization actions? What decontamination, grouting, and other treatment will be required after the tanks are emptied? Won't the vacuum obviate treatment? Why not vitrify and store the waste until it can be disposed of in a permanent geologic repository? How will soil and tank content disposal meet ARARs, especially RCRA requirements for hazardous landfills left in place and land disposal restrictions (LDRs)? [F7-39, F7-41, F7-43, N1-27, N1-28, N3-8, N3-14, N5-10]

Response: Treatment is any component of an alternative that reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants through destruction or alteration. Stabilization, by decreasing the mobility of hazardous substances, is a form of treatment. Proposed Plan wording may have incorrectly implied that stabilization is not a form of treatment.

Decontamination and other treatment as required to meet ARARs will be developed during the remedial design. Grouting, as a method of treatment or stabilization, will not be a part of the selected remedy.

Given the uncertain schedule for opening of a permanent geologic repository and the difficulty in estimating storage and disposal costs, vitrification and temporary storage of the waste would have very low cost-effectiveness. Moreover, it would likely not be able to be implemented within a reasonable time.

All applicable ARARs, as identified in Part II of this ROD, will be enforced by the Agencies. Verification techniques will be described in the remedial design. Satisfaction of LDRs, as required, will be enforced by the Agencies.

3.3.3 Soil Contamination Area South of the Turntable (TSF-06, Area B)

3.3.3.1 Soil Contamination Area South of the Turntable Description

59. Describe more fully the "previous removal actions" at this site. Are they the 1996 "Dirt Train to Hell"? [N5-11]

    Response: A non–time critical removal action was performed in 1995 under Operable Unit 10-06, which removed a total of 2,092 m^3 (2,737 yd^3) from an area of 180 by 90 m (600 by 300 ft). The average soil removal depth was 19 cm (7.5 in.) and the maximum depth removed was 45.7 cm (18 in.).

3.3.3.2 Soil Contamination Area South of the Turntable Alternatives

60. Support for the preferred alternative (Alternative 3a – Excavation and On-Site Disposal) was expressed in several comments, including one that endorsed Alternative 3 in general for technical reasons and another noted the needs for cost-efficiency and future land usability. [N2-3, N6-7, T1-2]

    Response: This readily implemented alternative results in high long-term effectiveness by removing contaminated soil and consolidating it in a managed repository.

61. Is the preferred alternative compliant with ARARs? A commenter specifically noted that the Idaho Air Toxic Air Pollutants, for radionuclides, and federal NESHAPs, for radionuclide emissions, were not listed as ARARs. [N1-29]

    Response: All applicable ARARs, as identified in Part II of this ROD, will be enforced by the Agencies.

3.3.4 Disposal Pond (TSF-07)

3.3.4.1 Disposal Pond Description

62. Several commenters requested more information on radium-226 at the TAN Disposal Pond. What are the radium-226 levels? Are they in fact below background? One comment noted that the selection between Alternative 1 and Alternative 3a depends on this information, which was considered inadequate in the February Proposed Plan. The November plan showed that additional investigations were conducted to fill the data gap, and one commenting group agreed with the conclusion presented there that the radium-226 level does not require remediation. [F7-23, F7-27, F12-8, N7-7]

    Response: Radium-226 does not require remediation at the TAN Disposal Pond (TSF-07). The February 1998 Proposed Plan listed radium-226 as one of the COCs at the Disposal Pond. Following the release of the first Proposed Plan in February 1998, further investigation of the radium-226 concentrations at the Disposal Pond determined that it is present at levels that are below naturally occurring background levels established for the INEEL. The CERCLA process does not require cleanup to below naturally occurring levels. The revised Proposed Plan issued in November 1999 reflected this expanded knowledge. Detailed information can be found in the Administrative Record in the *TAN TSF-07 Pond Radium-226 Concentrations* *and Corrections* report (LMITCO Engineering Design File ER-WAG 1-08, INEEL/EXT-98-00505, June 1998).

63. A comment asks why the site description fails to mention the removal action, called a "best management practice," conducted in the early 1990s that removed and grouted sediments from the pond inlet. Is the risk estimate based on the pond sampling conducted several years ago? Do risk estimates take into account continuing discharges after the date of pond sampling? Are metal concentrations in pond sediments still below risk levels? Has the Disposal Pond received purge water containing RCRA-listed wastes from surrounding wells that has contaminated the pond sediments? How will the Agencies address this issue? [F7-8/N1-32, N1-31]

    Response: The Agencies are not aware of any previous removal actions at this site. Surface water, sediments, subsurface soil, and perched water associated with the pond were sampled from 1982 to 1991. These sample data, together with process knowledge regarding the wastewater disposed of in the pond, were considered adequate to characterize contaminants at this site. Concentrations of radionuclides, metals, and organic materials within the soils of the inactive area of the pond were assessed; cesium-137 was determined to be the only contaminant posing a risk to human health and the environment that requires remediation. Current discharges into a separate 2.5-acre area within the disposal pond (the "active" portion of the pond) consist of sanitary and industrial waste and are made under a State of Idaho permit for Land Application of Wastewater. Because the disposal pond received waste listed under RCRA, additional samples will be collected as part of implementation of this ROD to provide data to support a no-longer-contained-in determination for this site. The comprehensive RI/FS concluded that metals, organic materials, and radionuclides other than cesium-137 were not present at levels sufficient to pose risks to human health or the environment.

64. Is the Disposal Pond a CERCLA site or a co-located facility? [F7-8]

    Response: The pond is considered a co-located facility. It receives treated sewage, boiler blowdown, and process wastewater under a State of Idaho permit for Land Application of Wastewater. A 5-acre portion of the TSF-07 Disposal Pond is contaminated by cesium-137 at levels posing a risk to human health and the environment that require remediation. Within the 5-acre portion, partitioned areas totaling 2.5 acres are still active, receiving sanitary and industrial wastewater under a State of Idaho permit for Land Application of Wastewater. The 2.5-acre area is a co-located facility and will be evaluated further when use is discontinued. The inactive area is being addressed as a CERCLA site under this ROD. The use of the same site number for both the inactive (CERCLA) and active (co-located) portions of the TSF-07 Disposal Pond is admittedly confusing.

3.3.4.2 Disposal Pond Alternatives

65. Community acceptance of the preferred alternative, Alternative 1 – Limited Action, was mixed. Two commenters who supported the preference for Alternative 1, stated that from cost or technical viewpoints, it appears to be the most practical. Another comment expresses a preference for Alternative 2b – Containment with an Engineered Barrier, as preferable to the "do nothing" Agency selection. A third comment expressed dislike for both Alternative 1 – Limited Action and Alternative 3 – Excavation and Disposal, finding it disadvantageous that they leave risk remaining into the future, requiring continued and extensive monitoring. [F8-1, N2-4, N6-8, T1-2]

Response: Alternative 1 – Limited Action will effectively protect human health and the environment from the risk posed by cesium-137 while allowing the active portions within the release site to continue operating. The cesium-137 (half-life of 30 years) will be attenuated through decay to below acceptable levels within the 100-year institutional control period.

66. What ARARs will Alternative 1 – Limited Action comply with? The comment suggests that they should be enumerated so the public can clearly see what the Agencies will comply with. [N1-33]

    Response: All applicable ARARs, as identified in Part II of this ROD, will be enforced by the Agencies.

67. How will the preferred alternative (Alternative 1 – Limited Action) address ecological risk at this site? Table 1 in the Proposed Plan indicates that the contamination in the Disposal Pond poses a hazard index of >1 to ecological receptors. The preferred alternative, Limited Action, does not address ecological risk, however. The commenting group's understanding is that ecological risks of >1 do not necessarily warrant remedial action and that at some point, remedial action is required to address ecological risks. The INEEL Citizens Advisory Board recommends that the WAG 1 ROD describe how the Limited Action alternative will address ecological risk at the Disposal Pond for the next 100 years. [N7-8]

    Response: This site will be evaluated in the site-wide ecological risk assessment under Waste Area Group 10.

68. Why are operations and maintenance (O&M) costs for Alternative 2b – Containment with an Engineered Barrier so much higher than for Alternative 1 – Limited Action? [F12-3]

    Response: The O&M costs for containment include all monitoring and review costs associated with Alternative 1 plus the costs of monitoring against subsidence, water infiltration, contour alterations, and other changes in protectiveness of the cover over time, which are actions not required under Alternative 1.

3.3.5 Burn Pits (TSF-03 And WRRTF-01)

3.3.5.1 Burn Pits Description

69. The characterization of the site may be incomplete. A commenter on both the February and November Proposed Plans believes the comprehensive RI/FS indicates that the possible presence of PCBs, dioxins, and furans was not investigated, which seems an oversight given that waste oils were burned during a time when PCBs were found in many oil products. The commenter contends that the Proposed Plan cannot be presented without a complete risk profile, which requires sampling for these contaminants. The same commenter asks, what are the expected concentrations, and related risk values, for the beryllium, chlorinated solvents, and products of incomplete combustion in these pits? [F7-11, F7-13, N1-34, N1-36, N1-38]

    Response: Activities at these sites very likely included the burning of used petroleum products and solvents. Therefore, a potential for PCB contamination exists. In addition, open burning of petroleum products and chlorinated chemicals could result in the production of dioxins/furans. Recent investigation into available records also indicates that other toxic substances, such as beryllium, chlorinated solvents, and used oils were disposed of in the pits.

Further contaminants may include pesticides and additional metals. Previous sampling did not identify these possible contaminants.

Pursuant to 40 CFR 300.430(a)(2), the RI/FS is to assess site conditions and evaluate alternatives to the extent necessary to select a remedy. The scope and timing of data collection, risk assessment, treatability studies, and analysis of alternatives, among other activities, should be tailored to the nature and complexity of the problems. Sampling and analysis shall obtain data of sufficient quality and quantity as necessary to achieve adequate data for use in selecting an appropriate remedy.

The selected remedy for the Burn Pits, Alternative 2, will used sampling and analysis to assess the sites for additional COCs that may not have been properly evaluated during the RI. If the sample analyses indicate that additional contaminants are present, and a cover can not be designed cost effectively to be protective based on the presence of these contaminants, and it is more cost effective to excavate and dispose of the waste, then this will be the selected alternative.

3.3.5.2 Burn Pits Alternatives

70. Support for the February Proposed Plan preferred alternative of Limited Action was mixed. One commenter who concurred with its selection did so on the basis of its low cost, and stated that even that cost was too much for the marker placement and caretaking costs described. No Action, the commenter concluded, would be even better, because that would be even cheaper at sites that the commenter feels warrant no remediation. Limited Action was found unacceptable by another commenter, however, because it was felt not to address the unknown risk from PCBs, dioxins, and furans, and would not address the risk to future residents from lead, which would remain the same in 100 years as at present. [F6-2, F7-10, F7-12, F7-28, T1-2]

    Response: The Limited Action alternative would rely on an existing soil cover, which in some places at the Burn Pits is less than 6 in. thick. Over the 100-year control period, the cover could be breached by wind erosion, resulting in potential contaminant transport by surface water and as fugitive dust. The reevaluation of the alternatives for the Burn Pits in response to public comment led to development of a new alternative and rejection of the previously preferred alternative.

71. Community acceptance of the preferred alternative selected in the revised Proposed Plan (Alternative 2 – Containment with Native Soil Cover) was low, with more commenters rejecting it than finding it acceptable. One comment calls it the "most practical" from a technical viewpoint, but said the cost "seems excessive." The comments that reject the containment alternative raise concerns about its ranking, its effectiveness, and its cost, but reject it primarily because it does not treat or remove contamination, and strongly favor Alternative 3b – Excavation and On-Site Disposal as "more effective at the same cost." The information presented in the revised Proposed Plan showed Alternative 3b – Excavation and On-Site Disposal ranking higher than the preferred alternative in long-term effectiveness and reduction of toxicity, mobility, or volume, and equaling it in all other criteria and in cost. A commenting group stated that it does not support selection of the preferred containment alternative unless cost is revised to be lower than the removal alternative. A commenter who rejected the previous preferred alternative reiterated that the risk from organic contaminants is not addressed. This commenter notes the NCP and 40 CFR 300.430 preference for treatment or removal over containment, and asks why lead will be left in place at an area with real potential for future use by the public? Also, won't the lead still be available through various

exposure pathways? Given that no INEEL soil cover has been "successful" for more than a decade, a commenting group would like an explanation of the basis for describing soil cover implementability as high. [N1-35, N1-37, N1-39, N2-5, N5-12, N6-9, N7-10]

Response: The Agencies believe that the selection of Alternative 2 – Containment with Native Soil Cover is supported by the analysis of cost-effectiveness, compliance with threshold criteria, and implementability. The remedial design will require sampling and analysis to design the soil cover to ensure that it will be completely protective of human health and the environment. If it were determined that a fully protective cover could not be cost-effective, then one of the Alternative 3 variations (Excavation and On-Site or Off-Site Disposal) would be selected.

72. Please explain the high operation and maintenance (O&M) costs for these sites – are they due to presence of other contaminants of concern besides lead? The appearance of precision in the Plan's cost estimate is misleading – the commenting group understood from a presentation that the capital cost estimate that it is based on the most costly possible requirement of a 10-foot engineered cover. What is the real range? Shouldn't future Proposed Plans present less precise cost estimates when appropriate? [N7-9]

    Response: The O&M costs for containment include all monitoring and review costs associated with Alternative 1 plus the costs of monitoring against subsidence, water infiltration, contour alterations, and other changes in protectiveness of the cover over time, which are actions not required under Alternative 1. Given the persistence of lead contamination, either Alternative 1 or 2 would likely require long-term monitoring and maintenance for the full 100-year period of institutional control. The RD/RA Work Plan will describe the engineered cover thickness requirements, which differ based on the amount of clean soil currently covering each of the Burn Pits. Appendix J of the comprehensive RI/FS provides detailed cost estimate assumptions, including ranges of estimates.

73. The statement in the November Proposed Plan that a variation of Alternative 3 (Excavation and Disposal) might be selected instead of Alternative 2 (Native Soil Cover), based on sampling and analysis, appears to a commenter to be an Agency proposal for a contingent ROD. The commenter believes this should be stated very clearly. As well, the commenter points out that site characterization should have been performed as part of the Track 2 investigation or the comprehensive RI/FS, and is not to be completed after the ROD. [N1-40]

    Response: CERCLA guidance documents acknowledge that there are limited situations in which flexibility may be required to ensure implementation of the most appropriate remedy. One such situation is where two different technologies under consideration appear to offer comparable performance on the basis of the five primary balancing criteria, such that both could be argued to provide the "best balance of tradeoffs." Under such circumstances, the Proposed Plan and ROD may identify one as the selected remedy and specify the criteria whereunder the other remedy would be implemented. The Agencies believe that the selection of Alternative 2 – Containment with Native Soil Cover is supported by the analysis of cost-effectiveness, compliance with threshold criteria, and implementability. The remedial design will require sampling and analysis to design the soil cover to ensure that it will be completely protective of human health and the environment. If it were determined that a fully protective cover could not be cost-effective, then one of the Alternative 3 variations (Excavation and On-Site or Off-Site Disposal) would be selected. This change would be documented in an Explanation of Significant Differences (ESD). The ESD would be placed into the WAG 1

Administrative Record, and the Agencies would provide notice to the public of the change in approach to this site.

3.3.6 Mercury Spill Area (TSF-08)

3.3.6.1 Mercury Spill Area Description

74. The risk descriptions for this site, indicating a total cancer risk to humans from mercury, were incorrectly presented in the February Proposed Plan. [F6-4, F12-5]

    Response: The commenters are correct that mercury does not present a cancer risk to humans. The November Proposed Plan revision clarified this in the table presenting risks.

75. Why doesn't the site description include the mercury found all along the tracks within the TAN area, from the removal action site over to TAN 648? Was the rest of the track contamination considered during the investigation? Why was the mercury not completely removed during the 1995 action? Why should taxpayers pay twice for remediation? [F6-3, F7-9, N1-41]

    Response: All railroad tracks areas were evaluated for possible mercury contamination. The initial cleanup of mercury was performed at the time of each spill in the 1950s and 1960s. Standard procedure at that time was to clean up the visible mercury. During later cleanup actions, mercury was cleaned up to meet goals that were based on soil ingestion risk-based levels. Later, during the comprehensive RI/FS, the site was reevaluated to compare homegrown produce ingestion risk-based concentrations. These levels are much lower than those for soil ingestion, because mercury can bioaccumulate (build up) in the plants. The remaining contamination exceeded those concentrations.

76. How can there be a risk through "ingestion of homegrown produce" from mercury that is more than 4 feet below the ground surface? Garden plant root systems are rarely deeper than 1 or 2 feet. The EPA typically uses a root zone depth of 8 inches to assess risk from homegrown produce. This risk appears to be the result of ultra-conservatism. [F6-4]

    Response: One assumption used in the hypothetical future residential scenario is that a future resident might excavate a basement 10 feet deep or down to the basalt bedrock, whichever is less, and spread the excavated (potentially contaminated) soil around their home. Produce grown in the contaminated soil would then complete the pathway of risk to the future resident. CERCLA guidance require extremely conservative risk assessments to ensure current and future protectiveness to human health and the environment.

3.3.6.2 Mercury Spill Area Alternatives

77. Community acceptance of the preferred alternative identified in the February Proposed Plan, Alternative 3 – Excavation and Off-Site Disposal, was low. One comment rejected it on the basis of low cost-effectiveness for a site with a conservative risk assessment and only a threshold level risk, and suggested that a No Action determination be considered. Another commenter doubted that the entire soil column contaminated with mercury would be addressed. Another commenter asked why the General Electric Mercury Extraction Process (GEMEP) alternative was not being considered to clean the soils instead, and provided details on its current use at a Superfund site. [F6-5, F7-29, F11-1, T1-2]

Response: Based on low community support for this preferred alternative and concern expressed about treatment of the contamination, the mercury spill area was removed from this ROD. A phytoremediation treatability study will be conducted at the site. Based on the results of the phytoremediation treatability study, a determination will be made as to subsequent action, if required.

78. Community acceptance of the November Proposed Plan alteration in approach to the Mercury Spill, wherein it was removed from this action to be used in a phytoremediation treatability study, was largely positive. A commenting group wrote to "applaud the selection of a preferred alternative that is both innovative and less costly than the other alternatives." Will there be coordination with Argonne National Laboratory-West, which is currently applying this alternative? How will the results of phytoremediation be communicated to the public? If additional remediation is required at this site after phytoremediation, how will public comment be sought? The Shoshone-Bannock Tribes would like to participate in the mercury contamination phytoremediation research. One commenting group had questions on the late addition of this alternative to the Mercury Spill discussion. How was the site chosen as a treatability study for phytoremediation? Why were no other alternatives discussed? [N1-42, N5-13, N6-11, N7-11]

Response: The design of the phytoremediation treatability study will include review of all current scientific documentation and ongoing research both in and beyond the DOE complex. Public information and comment opportunities will be carried out as part of the INEEL's public involvement activities. In developing alternatives, CERCLA guidance expresses a preference for the development of innovative treatment technologies if they offer the potential for superior treatment performance or implementability, fewer adverse impacts than other available approaches, or lower costs for similar levels of performance than demonstrated technologies. Phytoremediation is a low-cost remediation option for sites with widely dispersed contamination at low concentrations. The study will determine the rate of uptake of mercury by plants at the INEEL. Based on the results of the phytoremediation treatability study, a determination will be made as to subsequent action, if required.

3.3.7 Fuel Leak (WRRTF-13)

3.3.7.1 Fuel Leak Description

79. Several comments state the characterization of the Diesel Fuel Leak is incomplete in both the February and November Proposed Plan descriptions. Why wasn't the previous tank/soil removal action complete? Was or was not risk calculated in the baseline risk assessment? What is the actual maximum soil total petroleum hydrocarbon (TPH) concentration? Does it in fact show unacceptable future risk? What was the average post-sample TPH concentration? What is the Agencies' unit of concern – one cubic foot? one cubic yard? 100 cubic yards? If chemical analysis to show compliance with risk-based corrective action (RBCA) standards is not available, then isn't it the case that an action determination cannot be made until a complete risk profile is obtained through sampling? Comments received in February and repeated in November included a request to specify how much contamination was removed in the previous action, and exactly how much remains. Finally, a comment contends that in failing to indicate that this release resulted in gross contamination of the fractured basalt beneath the soil, the comprehensive RI/FS fails to consider this additional groundwater contaminant pathway and is thus incomplete. [F6-6, F7-14/N1-43, F7-16/N1-45, F7-30/N1-47]

Response: It was previously a common practice at the INEEL to remove as much visible contamination as possible when fixing pipe leaks and carrying out tank removals. During one of the tank removals, some soil could not be removed due to the location of a nearby tank. The various sampling events and the associated analytical results can be found in the Track 2 and comprehensive RI/FS documents.

Because diesel and petroleum products are not found in standard toxicity tables, typical risk assessment cannot be performed. The initial evaluation of the contamination was compared against a current suggested cleanup goal of 1,000 mg/kg. During the period when the RI/FS investigation was being conducted, the Idaho Risk Based Corrective Action (RBCA) standard was issued, and the Agencies agreed to utilize these standards as the required cleanup goals.

Data analysis and modeling, based on assumptions about the quantities leaked, concluded that the spill would not affect groundwater. No definite evidence of these petroleum products reaching the groundwater has ever been shown. Section 6.3.3.4 and Appendixes B and C of the comprehensive RI/FS provide details of the data analysis and modeling used to assess the potential for groundwater contamination from WAG 1 surface and near surface sources.

3.3.7.2 Fuel Leak Alternatives

80. Community acceptance of the preferred alternative presented in the February Proposed Plan (Alternative 2 – Limited Action) was low. Questions about it focused on cost-effectiveness, and showed a preference for removal or treatment. Why is contamination being left in place here instead of being removed? Why is it so costly? Why can't worker exposure during removal be held to a minimum, given that INEEL workers routinely handle petroleum-contaminated soil safely during landfarming at CFA? Another commenter found Limited Action unacceptable because it does not address the large amount of contamination left in place and extending through the vadose zone to the aquifer. [F6-9, F7-31, T1-2]

    Response: Based on comments received from the public, the Fuel Leak alternatives were reevaluated. As described in the Feasibility Study Supplement, an additional alternative, In Situ Biodegradation using Bioventing, was developed based on new information about its cost effectiveness at other petroleum-contaminated sites in the U.S. All alternatives were then reevaluated. The result was the selection of Alternative 4 – Excavation and Land Farming, which would have high long-term effectiveness through removal and treatment, and has the lowest cost of the four alternatives evaluated because it would not require long-term monitoring. The remedial design will specify personal protective equipment and engineering controls that hold worker exposure to contaminants to a minimum. The comprehensive RI/FS determined that contamination at the Fuel Leak site does not threaten the aquifer.

81. Community acceptance of Alternative 4 – Excavation and Land Farming, the Agencies' preferred alternative in the revised Proposed Plan published in November, was higher. However, comments showed that questions remained about its implementation and full effectiveness. Shouldn't any soil removed be subject to a full hazardous waste determination prior to land farming? The same commenter reiterates that the large amount of known contamination extending through the vadose zone to the aquifer is not completely addressed. Another comment asks why serious consideration isn't given to completing remediation for the entire petroleum-contaminated area now. What is now proposed amounts to three phases – the previous removal, the selected partial removal of soil between existing buildings, and a final future removal of soil below buildings after their decommissioning. Wouldn't it cost less to finish the job now? [N1-48, N1-50, N2-6, N6-10]

Response: Sampling will be performed before excavation to determine the volume of soil that must be removed. The samples will also be analyzed to characterize the contamination. The sampling and characterization will be performed as specified in the remedial design. The comprehensive RI/FS determined that contamination at the Fuel Leak site does not threaten the aquifer. The previous removal was in response to a spill and took as much soil as was thought to be necessary. The adjacent buildings are currently in use and are not scheduled for D&D within a timeframe such that deferring all remediation of the Fuel Leak site would be prudent management practice. An evaluation will be made in the remedial design to determine the most appropriate time to perform the remediation.

3.4 Other Issues

3.4.1 The Snake River Plain Aquifer/Groundwater

82. Several commenters believe the data indicate that several TAN sites have contaminated the groundwater with organics and radionuclides. One comment cites a demonstration that the regolith is permeable and a breathing effect occurs (IDO-12069), and expresses concern about organic contaminants. Another commenter strongly believes that WRRTF-13 (the Fuel Leak) has generated gross contamination in the fractured basalt beneath the site's soil, leaching to the aquifer. [F1-2, F7-14, F7-25, F7-31/N1-48, N1-10/N1-46]

    Response: The comprehensive RI/FS determined that contamination at the Fuel Leak site does not threaten the aquifer. The 1995 OU 1-07B ROD for the Technical Support Facility Injection Well determined on the basis of groundwater quality analyses that this well is the source of groundwater contaminants at TAN. The well was last used as a disposal site in 1972. Remediation of the contaminated groundwater plume below TAN is proceeding in accordance with the 1995 ROD. More information on this site is available in the Administrative Record for WAG 1.

83. The proposed placement of TAN waste, particularly waste containing mixed low-level waste and PCBs, into the proposed INEEL CERCLA Disposal Facility (ICDF) prompted questions about how that planned facility will protect the aquifer. What about the floodplain siting of the ICDF? What about its lining? How will disposal at the ICDF meet regulatory requirements? [F7-37, F7-42, N3-6]

    Response: The ICDF is being planned under Waste Area Group 3 at the Idaho Nuclear Technology and Engineering Center (INTEC; formerly the Idaho Chemical Processing Plant). A description of the proposed ICDF, including its siting, design, capacity, lifespan, and waste acceptance criteria, was presented in October 1998, in the Proposed Plan *for Waste Area Group 3 at the Idaho Chemical Processing Plant.* The Record of Decision for Waste Area Group 3 is expected to be finalized in September 1999.